

culturing a microorganism belonging to the genus *Mortierella*, wherein the microorganism is selected from the group consisting of *Mortierella alpina*, *Mortierella elongata*, *Mortierella exigua* <sup>and</sup> *Mortierella hygrophila*,

in a culture medium containing

phosphate ions in the range of 5 to 60 mM,

Potassium ions in the range of 5 to 60 mM,

sodium ions in the range of 2 to 50 mM,

magnesium ions in the range of 0.5 to 9 mM, and

calcium ions in the range of 0.5 to 12 mM, respectively,

to produce unsaturated fatty acids or a lipid containing them.

52. (New) The method according to claim 51, wherein the unsaturated fatty acid is arachidonic acid.

53. (New) The method according to claim 51, wherein the *Mortierella* microorganism is *Mortierella exigua* or *Mortierella hygrophila*.

54. (New) A process for producing unsaturated fatty acids selected from the group consisting of arachidonic acid, dihomo- $\gamma$ -linolenic acid, 5,8,11-eicosatrienoic acid and/or eicosapentaenoic acid, or a lipid containing them, which process comprises

culturing a microorganism belonging to the genus *Mortierella*, wherein the microorganism is selected from the group consisting of *Mortierella alpina*, *Mortierella elongata*, *Mortierella exigua* or *Mortierella hygrophila*,

in a culture medium containing

phosphate ions in the range of 10 to 45 mM,

potassium ions in the range of 10 to 45 mM,

sodium ions in the range of 5 to 40 mM,

magnesium ions in the range of 1 to 6 mM, and

calcium ions in the range of 1 to 9 mM, respectively,

to produce unsaturated fatty acids or a lipid containing them.

55. (New) The method according to claim 54, wherein the unsaturated fatty acid is arachidonic acid.

56. (New) The method according to claim 54, wherein the *Mortierella* microorganism is *Mortierella exigua* or *Mortierella hygrophila*.